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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/608,311	06/30/2000	Xiao-Dong Xiang	IB-1506 LBNL	9392

388 7590 12/15/2005

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EXAMINER

PATEL, PARESH H

ART UNIT PAPER NUMBER

2829

DATE MAILED: 12/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	09/608,311		XIANG ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Paresh Patel		2829	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 October 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-55 is/are pending in the application.
- 4a) Of the above claim(s) 1-21,31-42,44-52 and 55 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 22-30,43 and 53 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 22-30, 43 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gutmann et al. (Microwave Scanning Microscopy for Planar Structure Diagnostics, 1987 IEEE) in view of Zenhausern et al. (Apertureless near-field optical microscope).

Regarding claims 22 and 53, Gutmann et al. (hereafter Gutmann) in fig. 1-2 discloses a method for measuring electrical impedance [lines 1-3 of abstract on page 281] of a sample using a probe [lines 1-17 of Cavity Utilized, Measurement set-up and Test Structure on page 281] having a pointed tip [thin-conducting coupling element], comprising:

positioning said sample [conducting lines or planar test specimen] outside microwave cavity [fig. 1 or 2] and adjacent but not in contact with said tip [see space between coupling element and test structure in fig. 1 or 2 and last two paragraph of column 1 on page 282];

measuring interaction [see 1<sup>st</sup> and 2<sup>nd</sup> paragraph of column 1 of page 282] between said tip and said sample without contacting said sample with said pointed tip; and

deriving electrical impedance [conductance, see 3<sup>rd</sup> paragraph of column 1 on page 282] from said microwave cavity probe tip-sample interaction.

Gutmann discloses all the elements but silent about **pointed** probe tip. Rather, Gutmann discloses a tip, which has a diameter of 1 or 10 mil. Gutmann also discloses importance of this dimension (i.e. thin-conducting coupling element or probe tip) and separation between the tip and sample to control the evanescent field for coupling the cavity during measurement.

Zenhausern et al. (hereafter Zenhausern) in fig.1 discloses use of a **sharp tip** in tip/sample interaction for scattered electric field near the tip and to obtain super-resolution image at microwave frequency.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify probe tip of Gutmann to a sharp tip as taught by Zenhausern to obtain better resolution during tip-sample interaction.

Regarding claim 23, Gutmann discloses scanning evanescent microwave probe having said pointed tip extending from a coaxial or transmission line resonator [microstrip line of fig. 1]

Regarding claim 24, Gutmann discloses quantitative and qualitative measurements [see Fig. 4 and fig. 2].

Regarding claim 25, Gutmann discloses complex dielectric constant and conductivity [see abstract for dielectric and conductance].

Regarding claim 26, Gutmann discloses sample comprises a metallic conductors material [conducting lines]

Regarding claim 27, Gutmann discloses sample comprises multi-layered material [wafer].

Regarding claim 28, Gutmann discloses sample comprises a metallic conductors material [conductive lines].

Regarding claims 29-30 and 43, Gutmann discloses interaction is measured with modulated external field (electric field) [using network analyzer, evanescent electric field and tuning the disc, see first two paragraph of column 1 on page 282] as claimed.

3. Claims 22 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amar et al. (Near-field scanning microwave microscope with 100  $\mu$ m resolution) in view of Zenhausern et al. (Apertureless near-field optical microscope).

Regarding claims 22 and 53, Amar et al. (hereafter Amar) discloses a method for measuring electrical impedance of a sample using a probe having a pointed tip comprising:

positioning said sample outside microwave cavity [see fig. 1] and adjacent but not in contact with said tip.

measuring interaction [see Abstract] between said tip and said sample without contacting said sample with said pointed tip; and

deriving electrical impedance [column 2 on page 3272] from said microwave cavity probe tip-sample interaction.

Amar discloses all the elements but silent about **pointed** probe tip. Rather, Amar discloses a probe with different diameters to help generate the image of a sample.

Zenhausern et al. (hereafter Zenhausern) in fig.1 discloses use of a **sharp tip** in tip/sample interaction for scattered electric field near the tip and to obtain super-resolution image at microwave frequency.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify probe tip of Amar to a sharp tip as taught by Zenhausern to obtain better resolution during tip-sample interaction.

### ***Conclusion***

Said et al. ("Heterodyne Electrostatic Force Microscopy used as a New Non-contact test technique for Integrated Circuits" by Said et al. University of Manitoba, Canada. IEEE 1995) discloses pointed tip as claimed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paresh Patel whose telephone number is 571-272-1968. The examiner can normally be reached on 8:00 to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on 571-272-2034. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2829

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Dec. 09, 2005

Paresh Patel  
Primary Examiner  
Art Unit 2829